

Practice Questions

Lecture No. 6

Q1: Write the following sets in tabular form and set builder notation.

A = The set of first 10 Natural numbers.

B = The set of Integers between 7 and 14

C = The set of odd number between 3 and 11

D = The set of prime numbers less than 19

Answer:

$A = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$ or $A = \{x | x \in N \wedge x \leq 10\}$.

$B = \{8, 9, 10, 11, 12, 13\}$ or $B = \{x | x \in Z \wedge 7 < x < 14\}$.

$C = \{5, 7, 9\}$ or $C = \{x | x \in O \wedge 3 < x < 11\}$.

$D = \{2, 3, 5, 7, 11, 13, 17\}$ or $D = \{x | x \in P \wedge x < 19\}$.

Q2: Write the following sets in tabular form.

$$A = \{x : x \in Z : x^2 \leq 16\}$$

$$B = \{x : x \in E : x \leq 25\} \text{ , where E is the set of even numbers.}$$

$$C = \{x : x \in Z : 3 \leq x \leq 10\}$$

$$D = \{x : x \in Z : x^2 = 1\}$$

Answer.

$$A = \{-4, -3, -2, -1, 1, 2, 3, 4\}$$

$$B = \{2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24\}$$

$C = \{3, 4, 5, 6, 7, 8, 9, 10\}$.

$D = \{-1, 1\}$.

Q3 : Give example of Three Prime Numbers.

Answer: 2, 3, 5

Q4 : Give example of Three Rational Numbers

Answer: 1, 2, 3

Q5 : Give example of Three Irrational Numbers

Answer: $\sqrt{2}$, $\sqrt{3}$, π

Q6 : Give example of Three Whole Numbers

Answer: 0, 1, 2

Q7: Are these two sets $\{1, 2, 5, 9\}$ and $\{5, 2, 1, 9\}$ equal or not?

Answer: yes as they equal number of elements and same members.

Q8: Write the subsets of $\{a, b, c, d\}$

Answer:

$\{\emptyset, \{a\}, \{b\}, \{c\}, \{d\}, \{a, b\}, \{a, c\}, \{a, d\}, \{b, c\}, \{b, d\}, \{c, d\}, \{a, b, c\}, \{a, b, d\}, \{a, c, d\}, \{b, c, d\}, \{a, b, c, d\}\}$

Q9: What is a Venn diagram. Give example.

A Venn diagram is an illustration of the relationships between and among sets, groups of objects that share something in common. Its examples can be taken from the following link, select anyone figure from the following link:

https://sites.math.washington.edu/~mathcircle/mmc/mmc2012/sets2_worksheet.pdf

Usually, Venn diagrams are used to depict **set** intersections, unions etc.

Q10: Which states are True or False?

- i) $\{a, b\} \subseteq \{a, b, d, e\}$ *true*
- ii) $\{a, b, f\} \subseteq \{a, b, d, e\}$ *false*
- iii) $\{ \} \subseteq \{a, b, d, e\}$ *true*
- iv) $\{1\} \subseteq \{2, 3, 4, 5\}$ *false*
- v) $\{6\} \subseteq \{2, 3, 4, 5\}$ *false*
- vi) $\{2, 3, 4, 5\} \subseteq \{2, 3, 4, 5\}$ *true*
- vii) $Z \subseteq R$ *true*
- viii) $N \subseteq Z$ *true*
- ix) $P \subseteq N$ *true*
- x) $Q \subseteq R$ *true*